

INTRODUCTION

About the National Science Foundation

The National Science Foundation (NSF) is an independent Federal agency created by the National Science Foundation Act of 1950, as amended (42 U.S.C. 1861-75). The Act states that NSF shall consist of the National Science Board (NSB) and the Director and establishes NSF to, among other purposes, "promote the progress of science" and "advance the national health, prosperity, and welfare." The NSB establishes NSF's policies within the framework of applicable national policies as set forth by the President and Congress and, together with the Director, recommends and encourages the pursuit of national policies for the promotion of research and education in science and engineering.

From its first days, NSF has had a unique place in the Federal Government: It is responsible for the overall health of science and engineering across all disciplines. In contrast, other Federal agencies support research focused on specific missions such as health or defense. NSF is also committed to ensuring the Nation's supply of scientists, engineers, and science and engineering educators.

NSF funds research and education in most fields of science and engineering. It does this through grants to and cooperative agreements with more than 2,000 colleges, universities, K-12 school systems, businesses, informal science organizations, and other research institutions throughout the United States. NSF accounts for about one-fourth of all Federal support to academic institutions for basic research.

NSF receives approximately 30,000 - 35,000 proposals each year for research, education, and training projects, of which approximately 10,000 are funded. In addition, it receives several thousand applications for graduate and postdoctoral fellowships. NSF grants are typically awarded to universities, colleges, academic consortia, nonprofit institutions, and small businesses. NSF operates no laboratories itself, but it does support National Research Centers, user facilities, certain oceanographic vessels, and Antarctic research stations. It also supports cooperative research between universities and industry, U.S. participation in international scientific efforts, and educational activities at every academic level.

NSF is structured much like a university, with grants-funding divisions for the various disciplines and fields of science and engineering, and for science, technology, engineering, and mathematics education. NSF also uses a variety of management mechanisms to coordinate research in areas that cross traditional disciplinary boundaries. NSF is helped by advisers from the scientific community who serve on formal committees or as ad hoc reviewers of proposals. This advisory system, which focuses on both program directions and specific proposals, involves approximately 50,000 scientists and engineers each year. NSF staff members who are experts in a certain field or area make award recommendations; proposers get unattributed verbatim copies of peer reviews.

Grantees are wholly responsible for conducting their project activities and preparing the results for publication. Thus, NSF does not assume responsibility for such findings or their interpretation.

NSF welcomes proposals on behalf of all qualified scientists, engineers, and educators. It strongly encourages women, minorities, and persons with disabilities to participate fully in its programs. In

accordance with Federal statutes and regulations and with NSF policies, no person on grounds of race, color, age, sex, national origin, or disability will be excluded from participation in any program or activity receiving financial assistance from NSF, or be denied the benefits of such a program or activity, or be subjected to discrimination under any such program or activity, although some programs may have special requirements that limit eligibility.

Facilitation Awards for Scientists and Engineers with Disabilities provide funding for special assistance or equipment to enable persons with disabilities to work on NSF-supported projects. See *Grant Proposal Guide*, Chapter II, Section D.2. for instructions regarding preparation of these types of proposals.

NSF has Telephonic Device for the Deaf (TDD) and Federal Information Relay Service (FIRS) capabilities that enable individuals with hearing impairments to communicate with the Foundation about NSF programs, employment, or general information. TDD may be accessed at 703-292-5090; FIRS at 1-800-877-8339.

Deadlines and Target Dates

Many of the programs listed in this *Guide to Programs* have an established deadline or target date for the submission of proposals. Information about most of these dates can be found in the NSF *E-Bulletin*, an electronic publication available at <http://www.nsf.gov/home/ebulletin/>. Individual program announcements and solicitations also carry deadline and target date information, as do NSF Division websites.

A list of all deadlines sorted by date and by program area is available at <http://www.nsf.gov/home/deadline/deadline.htm>.

Eligibility Requirements

Except where a program solicitation establishes more restrictive eligibility criteria, individuals and organizations in the following categories may submit proposals to NSF:

- **Universities and Colleges**—U.S. universities and 2- and 4-year colleges (including community colleges) acting on behalf of their faculty members.
- **Nonprofit, Nonacademic Organizations**—Independent museums, observatories, research laboratories, professional societies, and similar organizations in the United States that are directly associated with education or research activities.
- **For-Profit Organizations**—U.S. commercial organizations, especially small businesses with strong capabilities in scientific or engineering research and education. An unsolicited proposal from a commercial organization may be funded in cases where the project is of special concern from a national point of view; where special resources are available for the work; or where the proposed project is especially meritorious. NSF is interested in supporting projects that couple industrial research resources and perspectives with those of universities; therefore, it especially welcomes proposals for cooperative projects involving both universities and the private commercial sector.
- **State and Local Governments**—State educational offices or organizations and local school districts may submit proposals intended to broaden the impact, accelerate the pace, and increase the effectiveness of improvements in science, technology, engineering, and mathematics education at K-12 and postsecondary levels.
- **Unaffiliated Individuals**—Scientists, engineers, and educators in the United States and U.S.

citizens may be eligible for support, provided that the individual is not employed by or affiliated with an organization, and

- the proposed project is sufficiently meritorious and otherwise complies with the conditions of any applicable proposal-generating document;
- the proposer has demonstrated the capability and has access to any necessary facilities to carry out the project; and
- the proposer agrees to fiscal arrangements that, in the opinion of the NSF Grants Office, ensure responsible management of Federal funds.

Unaffiliated individuals should contact the appropriate program before they prepare a proposal for submission.

- **Foreign Organizations**—NSF rarely provides support to foreign organizations. NSF will consider proposals for cooperative projects involving U.S. and foreign organizations, provided support is requested only for the U.S. portion of the collaborative effort.
- **Other Federal Agencies**—NSF does not normally support research or education activities by scientists, engineers, or educators employed by Federal agencies or Federally Funded Research and Development Centers (FFRDC's). However, a scientist, engineer, or educator who has a joint appointment with a university and a Federal agency (such as a Veterans Administration Hospital) or with a university and an FFRDC may submit proposals through the university and may receive support if he or she is a bona fide faculty member of the university, although part of the salary may be provided by the Federal agency. In some unusual circumstances, other Federal agencies and FFRDC's may submit proposals directly to NSF. Preliminary inquiry should be made to the appropriate program before a proposal is prepared for submission.

To check on special requirements for a specific program, consult the applicable program solicitation or contact the program directly.

Who May Submit Proposals

Scientists, engineers, and educators usually initiate proposals that are officially submitted by their employing organization. It is recommended that the proposal be discussed with appropriate NSF program staff before formal submission.

Graduate students are not encouraged to submit research proposals, but they can arrange to serve as research assistants to faculty members. Some NSF divisions accept proposals for Doctoral Dissertation Research Grants, which should be submitted by a faculty member or thesis adviser on behalf of the graduate student. NSF also provides support specifically for women and minority scientists and engineers, scientists and engineers with disabilities, and faculty at primarily undergraduate academic institutions.

Merit Review Criteria for the Selection of Research and Education Projects

Funding decisions on proposals are made largely through the process of merit review, in which expert evaluation by external peer reviewers contributes to recommendations by NSF program managers. NSF receives more than 170,000 external reviews each year from approximately 50,000 scientists and engineers.

The NSB approved revised criteria for evaluating proposals at its meeting on March 28, 1997 ([NSB 97-72](#))-reducing the criteria from four to two. The criteria are designed to be useful and relevant across NSF's many different programs, but NSF will employ special criteria as required to highlight the specific objectives of certain programs and activities. In evaluating a proposal, reviewers are requested to provide

detailed, substantive comments for *each* criterion, addressing the proposal's strengths and weaknesses with respect to relevant questions on which the reviewer feels competent to pass judgment. Suggested questions are listed under each criterion, all of which may not be appropriate for a given proposal. The reviewer also can identify and comment on additional relevant questions. A summary statement accompanying the proposal should be prepared by the reviewer to explain the relative importance of each of the criteria in the summary rating and the extent to which the proposal actually meets both merit review criteria.

On July 8, 2002, the NSF Director issued Important Notice 127, Implementation of new *Grant Proposal Guide (GPG) Requirements Related to the Broader Impacts Criterion*. This Important Notice reinforces the importance of addressing both criteria in the preparation and review of all proposals submitted to NSF.

In an effort to increase compliance with these requirements, the January 2002 issuance of the GPG incorporated revised proposal-preparation guidelines relating to the development of the Project Summary and Project Description. Chapter II of the GPG specifies that principal investigators (PIs) must address both merit review criteria in separate statements within the one-page Project Summary. This chapter also reiterates that broader impacts resulting from the proposed project must be addressed in the Project Description and described as an integral part of the narrative.

Effective October 1, 2002, NSF will return without review, proposals that do not *separately* address *both* merit review criteria within the Project Summary. It is believed that these changes to NSF's proposal preparation and processing guidelines, will more clearly articulate the importance of broader impacts to NSF-funded projects.

The two merit review criteria are as follows:

What is the intellectual merit of the proposed activity? How important is the proposed activity to advancing knowledge and understanding within its own field or across different fields? How well qualified is the proposer (individual or team) to conduct the project? (If appropriate, the reviewer will comment on the quality of prior work.) To what extent does the proposed activity suggest and explore creative and original concepts? How well conceived and organized is the proposed activity? Is there sufficient access to resources?

What are the broader impacts of the proposed activity? How well does the activity advance discovery and understanding while promoting teaching, training, and learning? How well does the proposed activity broaden the participation of underrepresented groups (e.g., gender, ethnicity, disability, geographic)? To what extent will it enhance the infrastructure for research and education, such as facilities, instrumentation, networks, and partnerships? Will the results be disseminated broadly to enhance scientific and technological understanding? What may be the benefits of the proposed activity to society? Examples illustrating activities likely to demonstrate broader impacts are available electronically at <http://www.nsf.gov/pubs/2002/nsf022/bicexamples.pdf>. Principal investigators should pay special attention to the following elements in their proposal, as well as to other questions relevant to broader impacts of the proposed activity, to provide reviewers with the information necessary to respond fully to both of the NSF merit review criteria. NSF staff will give these elements careful consideration in making funding decisions.

Integration of Research and Education. One of the principal strategies in support of NSF's goals is to foster integration of research and education through the programs, projects, and activities it supports at academic and research institutions. These institutions provide abundant opportunities in which individuals may concurrently assume

responsibilities as researchers, educators, and students and where all can engage in joint efforts that infuse education with the excitement of discovery and enrich research through the diversity of learner perspectives.

Integrating Diversity into NSF Programs, Projects, and Activities. Broadening opportunities and enabling the participation of all citizens—women and men, underrepresented minorities, and persons with disabilities—is essential to the health and vitality of science and engineering. NSF is committed to this principle of diversity and deems it central to the programs, projects, and activities it considers and supports.



For More Information

The *Grant Proposal Guide (GPG)* provides guidance for the preparation and submission of proposals to NSF. The latest edition is available at <http://www.nsf.gov/cgi-bin/getpub?gpg>. Some NSF programs have program solicitations that modify the general provisions in the *GPG*. In such cases, the guidelines provided in the solicitation must be followed. Contact with NSF program personnel before a proposal is prepared is encouraged.

Effective October 1, 2000, all proposals to NSF must be submitted electronically via the NSF FastLane system (<http://www.fastlane.nsf.gov/>). The *GPG* includes instructions on how to obtain an exception to the FastLane requirement for those who have difficulties with submission or cannot submit electronically to NSF.

Press Releases and Other Media Materials

As research results develop, NSF grantees should consider whether or not they might warrant National press interest. If so, the grantee should contact either the Media Section in NSF's Office of Legislative and Public Affairs, or the public affairs office of their home institution, to discuss the possibility of media coverage. Contact should be made far enough in advance of a formal announcement to allow sufficient time to develop an appropriate press strategy. Such a strategy may include a press release or news tip, video news release, press conference or briefing, or editorial (opinion) pieces. If unsure of the newsworthiness, contact NSF or the institution public affairs office. National media interviews should be granted only after advance coordination with a public affairs officer. The NSF Media Section can be reached at (703) 292-8070.

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